

In re ELLIOT, et al.
09/614,586

IN THE SPECIFICATION:

Please replace and center the Title of the invention as follows:

B
HEATING/AIR-CONDITIONING INSTALLATION FOR MOTOR VEHICLE INCLUDING MAIN
MODULE FORMING FLUID-CARRYING HEAT EXCHANGER

Please amend the Abstract as follows:

ABSTRACT OF THE DISCLOSURE

A heating/air-conditioning installation for a motor vehicle has a thermal loop which includes a refrigerating compressor, a gas cooler, a pressure-reducing valve, an evaporator, and a heating element. The gas cooler and the heating element are grouped together into a single exchanger including a main module forming a main fluid-carrying heat exchanger.

Please amend the paragraphs on page 3, lines 4-21 as follows:

B₂
- at least one surface providing an interface between the air and the heat-carrying fluid flowing through the main exchanger and/or at least one surface providing an interface between the air and the refrigerant fluid flowing through the main exchanger, and
- at least one surface providing an interface between the heat-carrying fluid and the refrigerant fluid of the thermal loop flowing through the main exchanger.

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The main exchanger may consist of a stack of modules, each of which includes:

- an element for exchanging between the heat-carrying fluid and the refrigerant fluid of the thermal loop, having at least one surface in thermal contact with an element for interfacing with the air; and
- the element for exchanging or interfacing with the air.

According to a first preferred variant, the element providing an interface between the heat-carrying fluid and the refrigerant fluid successively exhibits:

Please amend the paragraphs on page 4, lines 1-30 as follows:

and in which the element interfacing with the air exhibits a first surface for interfacing with a second surface of the second heat-carrying fluid circulation element and a second surface for interfacing with a second surface of the first heat-carrying fluid circulation element of an adjacent module.

 The element providing an interface between the heat-carrying fluid and the refrigerant fluid may successively exhibit: a third heat-carrying fluid circulation element having a first surface in thermal contact with a second refrigerant-fluid circulation element of the thermal loop; and the second refrigerant-fluid circulation element. In that way, the main exchanger exhibits surfaces for exchanging between the air and the heat-carrying fluid, between the air and the refrigerant fluid and between the heat-carrying fluid and the refrigerant fluid.

The main exchanger may include a collector of the heat-carrying fluid and a collector of

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refrigerant fluid of the thermal loop which are arranged at opposite ends of the exchanger.

The element providing an interface between the heat-carrying fluid and the refrigerant fluid of the thermal loop may exhibit at least one heat-carrying fluid circuit element for making the heat-carrying fluid circulate along an outwards and return path from and to the heat-carrying fluid collector and at least one refrigerant-fluid circuit element for making the refrigerant fluid of the thermal loop circulate, preferably at least partly counter to the flow of the heat-carrying fluid, along an outwards and return path from and to the refrigerant-fluid collector.

Please amend the paragraph on page 6, lines 10-11 as follows:

Bx - an air-conditioning mode in which the main exchanger is traversed by refrigerant fluid and by overcooled water, and

Please amend the paragraph on page 9, lines 3-22 as follows:

B The exchanger consists of a stack of modules 1 successively comprising an element 3₁, an element 2, an element 3₂, and an element 4 interfacing with the air which is generally formed from thin corrugated foil. The modules 1 are superimposed in such a way that the elements 4 have a surface for exchanging, on the one side 4', with an element 3₂ of a module 1, and, on the other 41', with an element 3₁ of an adjacent module 1. This structure particularly favors the exchanges between the water and the refrigerant fluid, all the more so since, as Figure 1b shows, the elements 3₁ and 3₂ can be assembled in such a way as to surround the element 2 which is traversed by the refrigerant

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fluid. Moreover, and for a better thermal exchange, the circulation of the water and of the refrigerant fluid takes place along a U-shaped outwards and return path from a water collector 11 arranged at one end of the exchanger and from a refrigerant-fluid collector 12 arranged at the other end thereof. Moreover, the respective U-shaped paths are preferably arranged in such a way that the fluid currents (water and refrigerant fluid) circulate as far as possible counter to each other.

Please amend the paragraphs on page 12, lines 6-27 as follows:

RJ In the air-conditioning mode, the mixing flap 49 is closed (position represented in Figure 3b) and the exchanger 42 is isolated from the airflow. The exchanger 42 is traversed both by the hot refrigerant which is leaving the compressor 41 and by the overcooled water ESR directed by the valve 46. The heat energy absorbed by the evaporator 45 is in that way disposed of to the outside by virtue of the overcooled water ESR which passes through the exchanger 42.

In the heating mode, the air conditioning is stopped and the exchanger 42 operates as a radiator which is traversed by the cooling water ERM from the internal combustion engine of the vehicle.

In the de-misting mode, the air conditioning is turned on and the mixing flap 49 is in the open position represented in Figure 3a. If it is desired that the de-misting operation be accompanied by cooling, the flap 49 is partially open. If the operation is accompanied by a desired heating-up, it is possible to make hot water circulate through the exchanger 42, for example the cooling water from the engine ERM instead of the overcooled water ESR, which somewhat degrades the operation of the

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air conditioning and makes it possible to stabilize the system which is generally unstable at low thermal load.
